

CLAIMS

1. An engine control system in a vehicle comprising:
 a variable displacement internal combustion engine;
 an intake manifold coupled to said variable displacement internal
 combustion engine;
 a throttle coupled to said intake manifold;
 a controller for controlling said throttle and said variable
 displacement internal combustion engine;
 an accelerator pedal having an accelerator pedal position sensor
 electronically coupled to said controller; and
 wherein said controller controls the position of said throttle to
 maintain a substantially consistent accelerator pedal position to generate
 substantially the same torque for different displacements of the variable
 displacement internal combustion engine, whereby changes in the
 displacement of the variable displacement internal combustion engine are
 transparent to the operation of said accelerator pedal.

2. The engine control system of Claim 1 wherein said throttle is an electronic throttle.

3. The engine control system of Claim 1 wherein said accelerator pedal position sensor is an encoder.

4. The engine control system of Claim 1 wherein said variable displacement internal combustion engine is a gasoline engine.

5. The engine control system of Claim 1 wherein said variable displacement internal combustion engine includes at least two cylinders.

Sub A
 Taguchi
 5
 of
 10
 102

Use
 102
 102

6. The engine control system of Claim 1 wherein said variable displacement internal combustion engine is an eight-cylinder engine.

7. The engine control system of Claim 1 further including an airflow sensor to detect airflow through said intake manifold.

8. A method of varying throttle position in a variable displacement internal combustion engine to produce a consistent relationship between the generated torque of the variable displacement internal combustion engine and the position of an accelerator pedal, comprising:

- 5 providing an electronic control module;
- providing an electronic throttle;
- providing an accelerator pedal having a position sensor;
- varying the displacement of the engine;
- converting the position of the accelerator pedal to a throttle
- 10 position command; and
- adjusting said electronic throttle in response to said throttle position command and the displacement of the variable displacement internal combustion engine to maintain substantially the same torque for different
- 15 displacements of the variable displacement internal combustion engine and an accelerator pedal position, whereby the position of said accelerator pedal will remain consistent for substantially the same variable displacement internal combustion engine output torque for different displacements of the variable displacement internal combustion engine.

9. The method of Claim 8 further comprising the steps of:

- providing an air flow sensor for measuring air flow into the variable displacement internal combustion engine; and
- adjusting the electronic throttle in response to the airflow.

10. The method of Claim 9 further comprising the step of
 A+B providing a manifold air pressure sensor for determining the air flow into the
 variable displacement internal combustion engine.

11. The method of Claim 8 further comprising the step of
 R+B providing a throttle position correction using a mass-air/cylinder servo
 control loop.

12. A method of providing a consistent feel in an accelerator
 pedal for a variable displacement internal combustion engine comprising the
 steps of:

5
 A+B providing an electronic throttle;
 providing a position sensor for the accelerator pedal;
 providing a reference torque model for the variable displacement
 internal combustion engine;
 providing a reference air flow model for the variable displacement
 internal combustion engine;
 10 providing a reference throttle model for the electronic throttle;
 generating a desired torque using said reference torque model;)
 generating a desired air flow using said reference air model; and
 adjusting said electronic throttle based on said desired torque, said
 desired air flow, and said reference throttle model to provide a consistent
 15 accelerator pedal position to produce a corresponding torque that is
 independent of the number of cylinders running in the variable displacement
 internal combustion engine.

13. The method of Claim 12 further comprising the step of
 A+B varying the displacement of the variable displacement internal combustion
 engine.

14. The method of Claim 12 further comprising the step of
providing a mass-air/cylinder servo to adjust said electronic throttle.

AttB